


Electric toothbrush with inclined bristles in brush section

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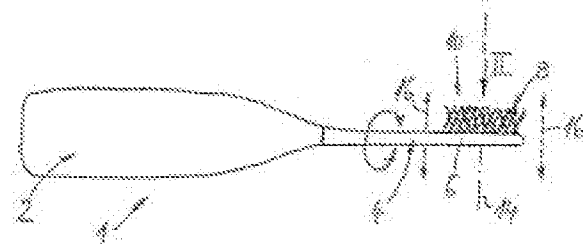
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Abstract of **DE 4412301 (A1)**

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The cleaning head (10) of the motor-driven toothbrush (1) has a brush section (4) which is, pref. exchangeably, coupled to the drive part (2). The bristles (8) are held in such a direction that they are inclined when in use to the tooth surface to be cleaned. The drive part puts the brush section in pulsating oscillation (16) in a direction (14) approximately at right angles to the surface to be cleaned. The



bristle ends are thus pushed over the tooth surface and reciprocatingly returned.

The instant invention concerns a motor operated, in particular electric toothbrush, existing from a drive member and with this in particular replaceable connected brush part with a finery head equipped with bristles.

With known toothbrushes of the genericin accordance with-eaten type usually the brush part of the drive member becomes in such a manner in oscillations and/or. in oscillatory trick or pivotal motions offset that drawn with the use the bristles in tooth longitudinal direction become over the tooth surfaces which can be deseamed, D. h. the bristles “wipe” only over the teeth, whereby however only a relative small mechanical cleaning effect becomes achieved. Thus - for the generation of caries considerably responsible - the tooth linings become often only insufficient remote. Besides by the finery movements accomplished in tooth longitudinal direction adverse-proves the gums successive pushed back, whereby however developing or progression becomes of Parodontose favored.

Corresponding one applies also to such apparatuses, with which also a finery head in rotation offset, equipped in circular flat distribution arranged bristles, becomes. Because here the bristles on their path come over the movement circular path repeated into a region, in which they subject then the teeth toward the gums.

The instant invention is the basis now the object to create a motor toothbrush of the genericin accordance with-eaten type the one particularly thorough tooth cleaning with simultaneous careful treatment of the gums ensured, and which is particularly suitable thereby to the Karies and Parodontose prophylaxis.

This by the fact achieved becomes according to invention that the bristles are in the finery head in such a oblique alignment supported that they are arranged with the use also oblique to (tooth) the surface which can be deseamed, and that the drive member the brush part toward axis of movement in such oscillatory knocking movements offset, vertical to the surface which can be deseamed etw that the bristles become withdrawn thereby as well as due to their inclination with their ends oscillatory over the surface which can be deseamed pushed and here are the

inclined/slanted bristles preferred so aligned that they lie with the application in planes, which are transverse to the teeth and thus approximately toward the edge of gum aligned.

By this advantageous embodiment an extraordinary thorough cleaning of the teeth becomes achieved, because pushed in a “pressure phase” of the knocking movement the bristles with their ends become over the tooth surface in each case, due to their inclination, by which they - after the principle of the “inclined plane” - slip away on the tooth surface. Thereby a practical “T/plate effect” becomes is enough, which provides for a very thorough cleaning and removal of the deleterious tooth linings. Beyond that achieved according to invention become that the ends of the bristles always move in longitudinal direction of the edge of gum, so that deleterious pushing of the gums back favourable-proves avoided becomes.

Other favourable arrangement characteristics of the invention are contained in the Unteransprüchen and the ensuing description.

On the basis, a preferred embodiment illustrated in the drawing in the following the invention is to become more near explained. Show:

Fig. 1 a side view of a toothbrush according to invention,

Fig. 2 an enlarged plan view on the finery head in arrow direction 11 in accordance with Fig. 1,

Fig. 3 a longitudinal section by the finery head in the cutting plane III III in accordance with Fig. 2,

Fig. 4 a longitudinal section analogous to Fig. 3, however in the cutting plane IV-IV in accordance with Fig. 2, and

Fig. 5 a view of the Oberkiefer teeth of human dentures to the explanation of the finery effect of the toothbrush according to invention.

In accordance with Fig. 1 consists a toothbrush according to invention 1 of a drive member 2 and one with this in particular more releasable, D. h. replaceable connected brush part of 4. The drive member 2 is preferred formed as handgrip and contains and described drive means, which shift the brush part of 4 in certain, not represented more near, still to explanatory finery movements. The brush part is appropriately 4 with the drive member 2 over a plug connection, in particular a snatchable rest connection, connected.

The brush part of 4 is in the represented embodiment analogous formed to a conventional hand toothbrush, D. h. it consists of elongated, in particular touch-like holding part 6, which is 8 provided at its end with bristles here and forms thus a finery head 10.

According to invention now the bristles are 8 in the finery head 10 in such a oblique alignment supported that them with intended use also oblique surface which can be deseamed to one and/or. Tooth surface 12 arranged are. This surface 12 is in Fig. 3 and 4 in each case by a dot and dash line indicated. In this connection it is to be understood bottom "intended use" that the finery head 10 becomes guided when deseaming the teeth so held and that it and/or. its bristles 8 exhibiting surface 13 always essentially parallel surface 12 arranged which can be deseamed in each case to that is, whereby the elongated holding part becomes 6 always parallel the edge of gum, thus transverse to the teeth, aligned. The drive member 2 is now according to invention and/or. the drive means in such a manner formed contained in it that the brush part of 4 toward one to the surface which can be deseamed 12 and/or. to the surface 13 vertical axis of movement 14 (see. Fig. 1, 3 and 4) in such oscillatory knocking movements (double arrows 16) offset it becomes that the bristles 8 become withdrawn thereby as well as due to their inclination with their ends oscillatory over the surface which can be deseamed 12 pushed and. These movements of the ends of the bristles 8 are in Fig. 5 on the basis double arrows 18 illustrated.

Like itself particularly from Fig. 2 to 4 results in, is the bristles 8 appropriately in several single bundle-like groups 20 summarized, whereby these bristle groups 20 in several to each other in particular parallel rows (S. in particular Fig. 2) arranged are. Here the bristles 8 point and/or. the bristle groups 20 preferably within a row in each case the same inclination and from row to in each case the adjacent row opposite inclinations up. This leaves itself on the basis the Fig. 2 to 4 easy reconstruct. The inclination of the bristles 8 and/or. Groups 20 is here according to invention like that that they lie in each case with the whole length in planes, those in longitudinal direction of the brush part of 4 and/or. the holding part 6 as well as at least approximate vertical to the surface 13 aligned are (Fig. 2).

It is convenient, if four to six, in particular - like shown - five rows of bristle groups 20 provided are. Each row consists of four to twelve bristle groups 20; in the represented embodiment each row consists however of only five and/or. four groups 20. On this embodiment the invention is not however by any means limited.

Of the surface 13 of the holding part 6 and/or. the finery head 10 outgoing bristles 8 and/or. Bristle groups 20 include an acute angle α in each case with the surface 13 between 90 DEG and 45 DEG, in particular about 60 DEG α DEG. If then the finery head 10 becomes guided with the intended use of the toothbrush according to invention 1 so held and the fact that the surface is 13 always at least approximate parallel arranged to the tooth surface which can be deseamed includes the bristles 8 also with the tooth surface in each case a corresponding angle α . By erfindungsgemäs the knocking movements (double arrows 16) then the ends of the bristles 8 in double direction of arrow 18 slip in accordance with Fig. 5 over the tooth surfaces. Beyond that it can be favourable, the drive member 2 and/or. to train the drive means contained in it in such a manner that the knocking movements according to invention of the finery head 10 still at least an other finery movement superimposed is. Here it can itself around oscillatory oscillations around the longitudinal axis of the brush part 4, D. h. around oscillatory partial rotations with small amplitude act. Additional ones or alternative a superimposed finery movement can be also as moving the finery head 10 back and forth toward the longitudinal extension of the holding part 6 and/or crosswise to it provided.

The invention is not on the represented and described embodiments limited, but enclosure also all embodiments same-acting in the sense of the invention. Furthermore the invention is so far limited not yet also on the characteristic combination defined in the claim 1, but can also by any other combination of certain features all altogether disclosed single characteristics defined be. This means that in principle practical each single characteristic of the claim 1 omitted and/or. by at least a single characteristic replaced disclosed at other location of the application will can. To that extent the claim 1 is to be only understood as a first formulation attempt for an invention.

1. Motor operated, in particular electric toothbrush (1), existing from a drive member (2) and with this in particular replaceable connected brush part (4) with a finery head (10), equipped with bristles (8), characterised in that the bristles (8) in the finery head (10) in a such alignment supported it are that they are with use oblique surface (12), which can be deseamed to one, arranged, and that the drive member (2) the brush part (4) toward one axis of movement (14), vertical to the surface (12), which can be deseamed, in such oscillatory knocking movements (16) offset that the bristles (8) thus and due to their inclination with their ends oscillatory over the surface (12), which can be deseamed, pushed and withdrawn become.

2. Zahnbürste according to claim 1, characterised in that the bristles (8) in several single bundle-like groups (20) summarized are, whereby the bristle is groups (20) in several to each other in particular parallel rows arranged, and preferably within a row the same inclination and from row to in each case the adjacent row opposite inclinations exhibit.

3. Toothbrush according to claim 1 or 2, characterised in that the finery head (10) an elongated, touch-like holding part (6) exhibits, are in such a manner supported in particular in which the bristles (8) that they are aligned concerning their inclination in longitudinal direction of the holding part (6) in each case.

4. Toothbrush according to claim 2 or 3, characterised in that four to six, in particular five, rows of bristle groups (20) provided is, whereby each row consists of four to twelve bristle groups (20).

5. Toothbrush according to claim 3 or 4, characterised in that the bristles (8) from one essentially plane surface (13) of the holding part (6) proceed and with this surface (13) in each case an angle (α) between 90 DEG and 45 DEG, in particular about 60 DEG to 70 DEG, include.

6. Toothbrush after or the several claims a 1 to 5, characterised in that the drive member (2) in such a manner formed is that the knocking movements (16) of the finery head (10) still at least an other finery movement is superimposed.

